



5. I have reviewed the Examiner's rejections of the presently claimed subject matter over U.S. Patent Nos. 5,318,669, 5,397,435, and 5,437,766.

6. The present invention provides a method of making a paper towel product and a single-ply paper towel product that achieves strength, absorbency, and softness that exceeds that of known single-ply paper towels, without a corresponding increase in the basis weight of the product. Specifically, when the strength of a paper towel is increased without a corresponding increase in the basis weight of the paper towel, it is expected that the softness of the paper towel will decrease. Additionally, when a paper towel is creped to increase the softness of the paper, it is expected that the strength will be reduced. As shown in the attached Figures 1 - 4, a creped paper towel of the present invention maintains high strength and softness, while having a lower basis weight than other single-ply paper towels.

7. Figure 1 is a plot of the relationship between the scalar rating of the subjective feel of a towel in a monadic test versus the geometric mean wet tensile strength. In a "monadic" test, a consumer uses a single product and evaluates its characteristics using a standard scale. Sensory softness is a subjectively measured tactile property that approximates consumer perception of sheet softness in normal use. Softness is usually measured by 20 trained panelists and includes internal comparison among product samples. The results obtained are statistically converted to a useful comparative scale. In the results of the monadic test depicted in Figure 1, a towel product according to the present invention is labeled F4-B. For comparison purposes, the same data has been plotted for single-ply KC Surpass® 50000, Scott 180, Scott Select® 189, and of one Georgia Pacific's current commercial single-ply folded towel

products (JR-065). As shown in Figure 1, even though the towel product according to the present invention has a lower basis weight than each of the other samples, the paper towel exceeds or substantially achieves both the geometric mean wet tensile strength and the softness of the other paper towels. Of note, the only paper towel exhibiting comparable geometric mean wet tensile strength, the KC Surpass® 50000 paper towel, rated approximately 1 unit lower than the paper towel of the present invention in softness. A difference of 0.3 units is considered significant.

8. Figure 2 is a plot of the relationship between the rating of the subjective sensory softness test versus the geometric mean wet tensile strength. Towel products according to the present invention are labeled F4-B, MH7, and MH8. For comparison purposes, the same data has been plotted for single-ply KC Surpass® 50000, Scott Select® 189, and one of Georgia Pacific's current commercial single-ply folded towel products. As shown in this plot, each of the towel products made according to the present invention had a higher softness rating than the prior art paper towels, while exceeding or substantially achieving the geometric mean wet tensile strength of the prior art towels. Specifically, each of the prior art towels had a scaled sensory softness of "0", meaning that each of the towels had generally the same softness. The paper towels of the present invention, on the other hand, had sensory softness of between about 0.6 and 1.2. A 0.4 softness difference is considered a significant improvement.

9. Figure 3 is a plot of the relationship between the scalar rating of the overall subjective perception of a towel in a monadic test versus the geometric mean wet tensile strength. This plot takes into consideration not only the perceived softness of the paper towel, but also the overall perception of the towel, including feel, absorbency.

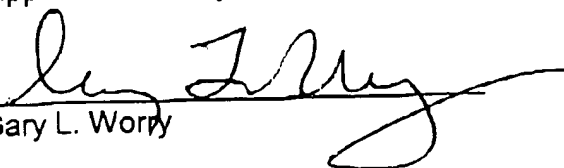
etc. A towel product according to the present invention is labeled F4-B. For comparison purposes, the same data has been plotted for single-ply KC Surpass® 50000, Scott 180, Scott Select® 189, and one of Georgia Pacific's current commercial single-ply folded towel products. As shown, the overall ratings of the paper towel of the present invention are higher than those of the prior art paper towels. Specifically, the monadic ratings of the paper towel of the present invention exceed all tested paper towels, except for the Scott 189 paper towel. However, the paper towel of the present invention has a geometric mean wet tensile strength of approximately 1250 g/3", while the Scott 189 towel has a geometric mean wet tensile strength of less than 1000 g/3". Additionally, the paper towel of the present invention has a basis weight that is lower than that of the Scott 189 towel by more than 6.5 lbs. per 3000 sq. foot ream, which represents a significant costs savings.

10. Figure 4 is a plot of the tensile modulus of stiffness versus the geometric mean wet tensile strength. The tensile modulus is an objective measure of the physical softness of the paper towel. Towel products according to the present invention are labeled F4-B, MH7, and MH8. For comparison purposes, the same data has been plotted for single-ply KC Surpass® 50000, Scott 180, Scott Select® 189, and one of Georgia-Pacific's current commercial single-ply folded towel products. As depicted in the graph, a paper towel of the present invention exceeds or substantially achieves the softness of the prior art paper towels, while exceeding or substantially achieving the geometric mean wet tensile strength of the prior art towels. In addition, these superior results are achieved with paper towels having a lower basis weight. Importantly, this

objective data regarding the softness of the paper towels agrees with the subjective monadic data set forth in Figures 1 and 2.

11. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: September 18, 2003

By: 
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